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A mixed methods approach to understanding funder trust and due diligence processes in online crowdfunding investment

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ABSTRACT

We report on two studies undertaken to establish the factors that affect funders' trust and likelihood to invest in crowdfunding campaigns online. Findings from an initial small-scale qualitative study are reported and subsequently triangulated in a larger quantitative survey. Across these studies, we demonstrate the importance of social information within the peer economy, with a strong reliance on other users across the course of the investment decision-making process. Decision-making on whether to invest is informed not only by the content of the crowdfunding campaign page, but also by social influence factors that are present (e.g. liking of the campaigner, reciprocity). It is further shaped by due diligence checks focused on the progression of the prototype for which funding is sought, and by assurances from outside the campaign page – namely on social media. Such assurances center around the importance of social proof, garnered through opinions of previous customers or other funders. The risk here is that much of this information is content that can be faked, and as such a reliance on this may leave potential funders vulnerable. Meanwhile, a genuine lack of prior experience and customer base means that some legitimate campaigners struggle to gain trust from potential investors who are reliant on such social information. Our findings present an empirical grounding to develop future security solutions that (i) protect existing funders and (ii) increase potential funders' level of trust, to encourage their engagement with legitimate crowdfunding campaigns.

KEYWORDS

Crowdfunding, Trust, Social media, Investment, Decision-making, Social influence, FinTech.

1 Introduction

In this article, we focus on *crowdfunding* as a commercial manifestation of trust and trust enacted through peer-to-peer investment. We explore what information sources funders use to establish trust when deciding which campaigns to invest in, and consider risks emanating from the potential unreliability of that information.

1.1 Crowdfunding

Crowdfunding has emerged in recent years as an alternative method for new businesses to raise capital, either to progress their business or to take a specific new product to market. These small businesses typically lack the financial history or stability to allow for corporate investment [1], and so instead build an online campaign to garner multiple small investments from peers. The emergence of crowdfunding can be understood within the societal shift towards a post-digital age, where online-offline boundaries are increasingly blurred, and

investor trust in large institutions and organizations (e.g. banks, hotels) has reoriented somewhat to a more peer-based approach, leveraging financial technologies (FinTech).

There are two prominent models of crowdfunding – *reward-based* and *equity-based*. Reward-based crowdfunding involves peer pledges being rewarded by a token gesture from the business, which can be as small as a ‘thank you’ message, or as large as a pre-order of the product being launched. Equity-based crowdfunding, on the other hand, gives the funder a small stake in the business, which results in on-going financial remuneration as the business grows and expands.

1.2 Trust, Risk and Uncertainty

One crucial element of the crowdfunding process, is for a funder to develop a level of trust in the campaigner. As with any commercial or business activity, the development of trust between a consumer (or funder in this case) and business owner (the campaign creator) is pivotal to investment, and as such to business success [2]. One core difference between traditional e-commerce and crowdfunding though is the unique type of uncertainty experienced in the latter, as the product is often at the prototype stage when funding is sought [3]. This means that additional judgments are required on the part of the funder to assess the capability of the campaigner and achieve the assurance needed to establish trust. Trust is defined in many ways across disciplines, but the persistent theme is the presence of risk and uncertainty in a decision. A definition that encapsulates these key concepts comes from Rousseau, Sitkin, Burt, and Camerer [4]: “*trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviors of another*”. A crowdfunder’s investment reflects trust that the campaigner has good intentions to deliver the promised product, and that the campaign is legitimate.

Risk and uncertainty for the funder lie in whether a product/business being advertised will be delivered as expected. Unlike other online marketplaces, there are additional layers of uncertainty in crowdfunding, based on the lack of accountability and regulation of campaigns that either do not deliver a product, or do not deliver it as advertised [5]. Potential funders must therefore simultaneously bring greater scrutiny and greater trust when considering whether to invest. These tensions can undermine investment likelihood, if funder trust is not established successfully [6]. Indeed, despite the continued growth of crowdfunding platforms as an alternative funding source, the average success rate of campaigns is less than 50%, with over half of campaigns never reaching their funding goal. A lack of trust that the campaigner will be able to deliver the advertised product/business plan is often reported as a common disincentive for funders [7]. Previous research has often acknowledged trust as a predictive factor to investment/purchase behavior in e-commerce and crowdfunding (e.g. [8,9]). However, as noted by researchers in this field (e.g. Liang et al), little research has explored the specific factors that contribute to the manifestation of trust. The research presented in this article builds upon the existing literature in an attempt to create a clearer picture of the factors affecting trust and investment likelihood, with specific emphasis on the social psychological mechanisms that can influence decision-making.

1.3 Due Diligence and Fraud

Where funders do engage, the scale of investments typically associated with crowdfunding are smaller than traditional investment models, meaning less perceived risk. In line with the Elaboration Likelihood Model (ELM; [10]) which outlines two distinct information processing routes within the decision-making process – central (critical evaluation of information associated with the decision being made) and peripheral (reliance on overall impression of information without careful examination), the low motivation associated with a smaller investment may lead to over reliance on peripheral processing to inform decisions. As such, funders may be less likely to engage in time-consuming ‘*due diligence*’ assessment of a campaigner [7]. Due diligence refers to actions taken to ensure that an activity is safe. With regards to crowdfunding, due diligence checks allow a potential funder to build confidence in their investment and trust in the campaigner. This may typically involve background checks to ensure the legitimacy and viability of the campaigner as an unknown party.

A lack of such due diligence can leave the funder more vulnerable to fraudulent campaigns, where risks include not only loss of investment, but also loss/ misuse of personal information linked to the funding (as seen in the case of Erik Chevalier [11]), and even risks to personal safety (for example, where funders were allegedly threatened by the fraudulent campaigner Douglas Monahan [12]). The harm done by fraudulent campaigns extends beyond harm to individuals: there is also potential harm to funders' overall trust in crowdfunding as an investment vehicle. Reduced trust may deter potential funders from investing with legitimate crowdfunding campaigns as a result [13]. As such it is important to tackle the issue of fraudulent campaigns before funders become victims, and a thorough understanding of the due diligence process can work towards achieving this. By understanding the processes that determine current due diligence practices, as we attempt to do in the research presented in this article, it will be possible to encourage optimal practice in funders to ensure their protection against fraudulent campaigns.

2 Literature review

Previous literature that explores crowdfunding success has focused predominantly on patterns of investment and the motivations that lead funders to pledge support for a campaign, in an attempt to increase the profitability for creators [15]. This literature provides valuable insights from an economic perspective but there is little emphasis on understanding how trust manifests in relation to crowdfunding, and the psychological mechanisms underlying funder decision-making. However, Liang et al. [2] have recently outlined a theoretical model that draws upon Kim, Ferrin, and Rao's [15] e-commerce decision-making model to explain trust-based decision making specific to crowdfunding. This model highlights four core factors that influence investment decisions: project information quality, fundraiser ability, fundraiser reputation, and value similarity. In this review, these four factors are outlined, alongside relevant literature, before being related to complimentary social psychological mechanisms to further explain the decision-making process.

Project information quality focuses on the content available through the campaign page itself – something which has been further reiterated in research that analyses campaign pages to establish predictors of success (e.g. campaign word count and use of a campaign video [14]). Liang et al. found fundraiser ability to have the largest effect size though in relation to predicting trust, which is in line with other research demonstrating the importance of prior campaign success and reciprocal funding [e.g. 16, 17]. This is further supported by analysis of proven fraudulent campaigns on crowdfunding platforms, through which Cumming, Hornuf, Karami, and Schweizer [18] demonstrated that previous crowdfunding experience is a valid indicator of legitimacy, with fraudulent campaigners being less likely to have orchestrated previous campaigns. Campaign history alone though cannot be relied upon as an indicator of trustworthiness, given that a lot of crowdfunding campaigns are run by startups who are launching their first product.

As such, this demonstration of ability is often also perceived through social information available to a potential funder, which ties in with the notion of fundraiser reputation. The lack of experience for many start-up companies launching crowdfunding campaigns means that reputation in the business sense can be a difficult asset to demonstrate to potential funders. Metrics such as 'likes' on the campaign page or reviews from previous customers can increase investment likelihood though, where these are available [14]. In line with this, there is evidence to suggest that the most common type of updates on a campaign page are those that attempt to garner social promotion, through requests to share the campaign with friends and across social media [19].

Social media itself can act as a valuable source of social information about a campaigner, although it is not explicitly outlined within Liang et al's model. Research demonstrates a link between social media presence and increased likelihood of receiving funding [20, 21], although this is typically data gathered through secondary analysis of campaign pages. Social media can provide both due diligence around the legitimacy of a campaigner, as well as additional social information and networking opportunities that can increase the feeling of connectedness. However, an over-reliance on information gathered from social media brings

inherent risk due to the increasing ease with which social media information can be manipulated [22]. Information that may be taken to indicate a well-connected and reputable campaigner or organization - such as number of followers, number of likes on posts - can be artificially generated with ease to create an illusion of social support and engagement. Based on the prominence of diverse social information acting as a metric for establishing trust in a campaigner, we propose that rather than ‘funder reputation’ as outlined by Liang et al., ‘funder social credibility’ may be a more encompassing factor in the decision-making process. This emphasizes the role of reputation, alongside crucial demonstration of connectedness and communication from the campaigner [23] through the campaign page and social media.

Within rewards-based crowdfunding, a desire to own the product or collect the reward is often reported as a strong predictor of investment likelihood [6], which supports the notion of value similarity, in the sense of shared interests, being a final important factor in the decision-making process, as outlined by Liang et al. Across all of these factors, there are parallels with the six principles of persuasion outlined by Cialdini (reciprocity, liking, social proof, commitment, authority, and scarcity [24]). These principles are often cited in relation to decision-making processes, in particular around business and marketing. Evidence demonstrates that when a person supports the campaigns of others, others in turn are more likely to support them [17] – highlighting the principle of reciprocity. Activity on social media and the campaign page may elicit perceptions of social proof (e.g. through the active support of other users [14]), liking (e.g. through a shared interest in the product area and value similarity [2]), and commitment (e.g. through project updates [19] and engagement with funders). Evidence of these social influence principles may therefore increase the likelihood of investment, based on the great importance that humans put on social information to inform behavior (as seen in social learning theory; [25]). Therefore, this research will consider the factors that inform trust decisions in crowdfunding, with particular emphasis on the role of social media and placing key factors within the framework of Cialdini’s principles of persuasion.

Much previous research has considered the frequency of campaign successes in relation to social information availability, through secondary data analysis of campaign page content [e.g. 5, 17, 21] or through data from project campaigners [e.g. 20]. However, little research has asked funders firsthand how social information, and in particular social media, influences their decision-making process. In order to understand the best ways to protect users from risks such as fraudulent crowdfunding campaigns and implement secure practice, it is important to initially understand the mechanisms they currently employ to make decisions and the due diligence conducted to protect themselves. Although patterns in existing data are valuable from a business perspective to increase campaign success, behavior change and solutions designed to improve security need to be generated from the perspective of the users themselves in order to maximise effectiveness. As such, we aim to address two core research questions within this article:

RQ1: Based on firsthand insights from crowdfunders, what factors underpin the investment decision-making process, and development of trust in a campaigner?

RQ2: What due diligence processes do crowdfunders currently engage in, both on the campaign page and through external social media pages?

3 Current research

In this paper we take a mixed methods approach to address the research questions outlined above. The two studies presented explore the investment decision-making process, including factors within the crowdfunding campaign itself, as well as the influence of social media and the typical due diligence processes that users engage with. As outlined above, this research draws upon the first-hand experiences of crowdfunding users in an attempt to replicate findings that have been highlighted in analysis of secondary data, whilst also building upon the decision-making model outlined by Liang et al [2] with the incorporation of information from social media as an additional metric that may inform investment decisions.

The first study presented takes a qualitative approach, providing a rich data set from 11 users with experience in crowdfunding, to explore factors that affect funders' trust and likelihood to invest in crowdfunding campaigns online. The second study ($n = 139$) triangulates these findings through a quantitative survey, to provide mutual validation of the data, and present a more complete and empirically valid account of investment decision-making [26]. This study also introduces individual difference factors between users that might influence the decision-making and due diligence processes that they engage in. Across these studies, our results demonstrated the influence of the campaigner, social information and the product in the investment decision-making process. Decisions on whether to invest were informed not only by the content of the crowdfunding campaign page, but also by social influence factors that were present (e.g. liking of the campaigner, reciprocity). They were further shaped by due diligence checks focused on the progression of the product prototype for which funding was sought, and through assurances garnered through opinions of previous customers or other funders on social media, outside of the campaign page. In reflecting on our results, we consider the risks inherent in this approach to due diligence. Much of the information used as input is content that can be faked or produce unreliable signals to legitimacy. Reliance on it may leave potential funders vulnerable to fraud. Meanwhile, some legitimate campaigners may struggle to gain trust from potential investors who are reliant on such social information, due to a genuine lack of prior experience and customer base.

The research reported herein was undertaken as part of a wider endeavor - TAPESTRY [27] - which is developing a novel blockchain-based security service for reliably proving the provenance of online digital identity. Our findings on factors that affect funders' trust and likelihood to invest in crowdfunding campaigns serve as input to the design of this service, by highlighting the metrics that users typically rely on. Verification of these metrics will act as an assistive tool to help non-expert users (such as crowdfunding investors) make better decisions about whom to trust online. By drawing attention to potentially unreliable signals and false online identities, we anticipate that this security solution will protect funders from investing in fraudulent campaigns, whilst simultaneously increasing their level of trust and engagement with legitimate crowdfunding campaigns.

4 Study 1: Exploring factors that influence crowdfunding investment decisions – a qualitative study

This study takes a qualitative approach to explore the factors that funders recognize as important to establishing trust when deciding which campaigns to invest in. Building on previous research that has explored motivations to fund and success signals in a campaign page, this research focuses on the decision-making process. This includes the social influence factors that increase investment likelihood, as well as the due diligence processes that funders typically go through on the campaign page and through external sources such as social media. This is an initial exploratory study, using interview and focus group methods, designed to highlight key themes in relation to these core processes within crowdfunding. Based on the participants sampled, there is a predominant focus on users of reward-based rather than equity-based crowdfunding in this dataset.

4.1 Materials and methods

Ethical approval for this research was granted by the University of Dundee School of Nursing and Health Sciences Research Ethics Committee. All participants gave fully informed written consent before taking part.

4.1.1 Participants.

A total of 11 participants were recruited for this study, with 9 males and 2 females. The mean age of this sample was 26.82 years ($SD = 8.28$), with an age range from 19 to 48 years. This sample was recruited through online adverts, and all participants had prior experience of funding people that they did not know

personally through crowdfunding platforms. The recruitment criteria around crowdfunding experience and limited availability of participants meant that there was an element of self-selection bias in the sample gathered as there were not enough potential participants to allow for random sampling. However, recruitment efforts were expanded to reach national and international participants, allowing a sequential sampling method with opportunity to recruit participants from a more diverse participant sample, until a point of data saturation. Only once data saturation had been reached were recruitment efforts stopped, ensuring an adequate sample size appropriate for the research being conducted [28].

4.1.2 Materials.

Participant questionnaire. Prior to the interview, participants were asked to complete a brief demographic questionnaire, which included eligibility questions about their prior experience with crowdfunding platforms. Following this, participants were asked to indicate their availability to participate in the interview part of the study. Participants who indicated that they had previously funded individuals they did not know personally were then invited to participate in the interview stage, based on the availability that they had indicated.

Interview protocol. Participants were invited to take part in a discussion about their experiences on crowdfunding platforms. This discussion took the form of either focus groups or one-to-one interviews. Variation was due to practicalities in interviewing participants, some of whom were located nationally and internationally, and as such sessions were arranged to suit their availability. A very similar protocol was used in each of these formats, providing a set of core questions that were then adapted to explore points of interest further during the data collection session. The protocol was developed based on the research questions outlined above. Topics covered using this protocol included background information about involvement in crowdfunding, investment decisions, negative experiences, perceptions of security risks associated with crowdfunding, due diligence processes and potential added assurances that might alleviate security concerns.

Procedure. Initially, participants were recruited in the local area to take part in focus group sessions. The research was advertised on Facebook, Twitter, and Reddit, via the researcher's personal accounts, with the posts then being shared by local community groups. Poster adverts were also placed across the University, with participants asked to sign up via an online form that also allowed them to indicate their availability to take part. For the first focus group, six participants attended a session within the University of Dundee. Upon arrival, participants were given a written and verbal overview of the research and invited to ask any questions.

Limited availability of multiple participants at the same time in the local area resulted in an initial move to online focus groups, which allowed for wider advertisements and the researcher's social media posts were targeted at crowdfunding groups globally. The practicality of running sessions with multiple participants simultaneously again proved difficult though, with limited participant sign-ups and availability. This led to a decision instead to conduct one-to-one interviews at a time that suited the participant. One online focus group was conducted with two participants, and then a further three one-to-one interviews were conducted (two online via Skype and one offline). Using Skype to conduct the interviews meant that the research was also able to reach a wider audience, thus reducing bias based on the geographical location of the participants.

For all participants, the initial online sign up stage allowed for completion of the participant questionnaire, as well as indication of availability. All focus groups and interviews were carried out by the lead researcher, based upon the interview protocol outlined above. Questions were adapted to fit the discussion of the particular group or interviewee to allow for flexibility and ensure maximum insight was gained. All discussions were audio recorded and later transcribed for analysis. Thematic analysis was conducted, following standard guidelines from Braun and Clarke [29], which cover six phases of data analysis. Transcripts were first read for familiarization, and then broken down into initial codes based on commonalities seen across the data set. At this point, individual quotes/points were drawn out that related to these initial codes. The codes were then grouped together to generate themes and sub-themes, with quotes relevant to core concepts collated together. Following initial coding and a review of the themes, inter-rater

reliability was calculated with a second coder analyzing 10% of the data. This produced an inter-rater agreement of 75%, following which discussions were held to allow for clarification of judgments and finalizing of themes within the codebook. As a result, both raters were confident that the final codebook was representative of the key themes within the data and was suitable for the production of the results reported in the following section.

4.2 Results

4.2.1 Crowdfunding experience.

Within our participant sample, 64% of participants reported that they had previously used crowdfunding for both funding projects and raising money for their own projects. The remaining 36% had used crowdfunding only for funding others. With regards to type of crowdfunding, 73% of our sample had been involved only with rewards-based crowdfunding, whilst 27% had been involved in both rewards- and equity-based crowdfunding.

4.2.2 Construction of themes.

In line with the semi-structured nature of the interview protocol designed for this research, a similar pattern of topics emerged during thematic analysis of the data. Across the focus groups and interviews conducted, four key themes, with ten subthemes, emerged. These are outlined in Table 1 and discussed in more detail below. Results will be outlined under each of the four themes, with subthemes discussed within these.

Table 1: Framework of crowdfunder interview themes

Theme	Subtheme
1. Initial interest in the campaign	1.1 Desire for the product 1.2 Online promotion 1.3 Personal interest
2. Decision-making process	2.1 Content on the campaign page 2.2 Social influence
3. Due diligence	3.1 Progression of prototype 3.2 Assurances 3.3 Risk factors
4. Maintaining trust post-investment	4.1 Communication from the campaigner 4.2 Desired assurances

4.2.3 Initial interest in a campaign

When it comes to finding crowdfunding campaigns to invest in, the majority of participants indicated that they most often heard about these from third party websites, rather than by browsing crowdfunding platforms. Many participants reported seeing campaign coverage on social media or other community pages, “*either via blogs, Facebook where somebody else has liked something*” (Participant 11). Facebook and Twitter were the prominent social media sources mentioned, typically reached either from the company advertising their own campaign or from a friend’s activity on a social media feed.

A personal interest in the project category (e.g. gaming, technology, film) was found to be an important influence, with “*something that I’m interested in or passionate about*” (Participant 7) being more appealing. More specifically, a number of participants emphasized that their interest was piqued by a desire to own the

product being advertised and ensure that it is produced, *“I wanted it; I wanted the game, wanted the limited-edition version of the game. So they had me straightaway”* (Participant 13). In some cases, participants admitted that the desire to own the product may result in them *“accepting the risk that it might not deliver and just putting my money there”* (Participant 4).

4.2.4 Decision-making process

Having demonstrated an initial interest in a crowdfunding campaign, the potential funder then typically spends time analyzing the campaign page and making a decision on whether to make a pledge. This decision-making process is influenced by the content on the campaign page itself, and by social influence factors.

Campaign page content. The campaign page itself is screened: participants looked for numerous cues to the likelihood of success, as well as the legitimacy of a project. An overall impression of professionalism and competence from the campaigner was mentioned by many participants, as an indicator that *“this creator has done their homework”* (Participant 12). Evidence that effort and money has been put into setting up a campaign also adds a level of assurance, demonstrating dedication to the project, with one participant outlining the key campaign page attributes that they are looking for:

“I then look at whether the quality of Kickstarter campaign looks like it’s had some money poured into it, so does it look legitimate, is it like a chunky jumbo campaign where they have stages, you know, a product plan they’ve followed and do they have like defined deadlines and do they already have the manufacturing tied down” (Participant 11).

This idea of a clear plan for the project was deemed important, as was recognition of *“risk details, so people could see whether [they] were likely to fail or what not and you knew what you were getting into”* (Participant 11). The recognition of potential risk factors demonstrates a higher degree of knowledge around the crowdfunding process, providing added reassurance for a potential funder. One element that was persistently recognized by participants as demonstrating effort and commitment to the project was the presentation of a campaign video. In some cases, the mere presence of a video provided assurance, as this means *“it wasn’t so easy to just mock up a campaign”* (Participant 11), given that this requires a lot more time than simply setting up a page. Others emphasized the importance of video quality, with consideration of *“how professional the video has been made, you know sometimes they post a video that are not really good, you know, they just, it seems like they made it with an iPhone or like with a very cheap tool”* (Participant 1). Whilst videos go some way to providing the potential funder with reassurance, it is clear that there are gradients in the impact this can have on investment likelihood dependent on quality. Videos were deemed more useful if they contained footage of the product, or prototype, rather than *“just people talking about what they want to do, instead of showing what they’ve already done”* (Participant 2). The video was not deemed as much of an assurance for one participant though, who commented that *“they can plough loads of money into making a great video but then still...not produce a product at the end of the day”* (Participant 6).

Social influence. Aside from the content of the campaign page itself, participants highlighted decision-making factors that relate to social influence techniques outlined in the Literature Review section of this paper. Many participants indicated that they would be more inclined to support a campaign being run by a company that they had previously interacted and were familiar with, either through prior crowdfunding campaigns or through purchases outside of these platforms. For example, when a potential funder has *“partially played three previous games in the series so I just thought, hey this looks good, why not put some money into it”* (Participant 2) or *“somebody that you’d already be interested in is bringing something to market or trying to and they can only use crowdfunding as a method to bring it”* (Participant 11). This type of past interaction can instigate *“an innate trust too anyway, because I kind of had knowledge of them”* (Participant 13). In cases where the company is not familiar, participants reported that they were often reliant on the behavior of others to guide their investment decisions, choosing to fund campaigns that *“people with similar interests seem to have a good opinion of”* (Participant 5). This also included an inclination to simply follow the crowd, when *“they [the campaigner] got a lot of coverage which, again, then made more people*

sign up to back it. I probably did get swept up a little bit in that” (Participant 13). This was also amplified in some cases by a desire to help out the campaigner, getting into the “*ethos*” of what crowdfunding is about, “*contributing to a project just to see it succeed*” (Participant 12).

The campaigner(s) themselves can have an important role in the decision-making process, with participants reporting that they are more likely to support someone with “*sincerity*”, encouraging the potential funder to “*believe in them, rather than the product*” (Participant 11). A more personable approach was appreciated, as it was thought that this means “*people can engage, especially if maybe [their] target audience can relate to them [the campaigner]*” (Participant 3). Participants also reported anecdotes indicating that campaigners who they liked, or “*were very funny*” (Participant 13), were more likely to elicit funding, as opposed to campaigners who were overly self-assured about the worth of their campaign, and as such were not personable. On the other hand, a “*sense of entitlement*” was deemed an off-putting factor that may deter potential funders:

“I can’t even word it, but like it’s more of a ‘this needs to happen’, almost like ‘I deserve this to happen to me’, kind of thing. And I much prefer that tone of ‘there’s no other way of this happening, please help, and if you don’t that’s ok’, but you know, there’s this idea and they’re trying to make it happen. Like it really puts me off when people are like, I’ve even seen people share on Facebook if it’s half way through and not enough people have donated just kind of rant on Facebook ‘why are people not helping, what have I done wrong?’. Well, that’s it, that’s what you’ve done wrong, you know. So I think that weird sense of ‘I deserve to be helped in this’ really puts me off.” (Participant 14)

Many of these influential factors may be overlooked though when a limited edition version of the product is available for purchase, eliciting a sense of scarcity and increasing investment likelihood, with supporters spending “*far too much money on it*” (Participant 13). Additional influence may come from a feeling of reciprocation owed to other crowdfunding users. Participants who had previously run their own campaigns reported an increased need to ‘pay-back’ this investment to others, having “*contributed more to pages since then, since having the experience of asking people for that*” (Participant 14).

4.2.5 Due diligence

In general, participants recognized that there was some level of risk associated with crowdfunding investment, although none specifically highlighted concern about fraudulent campaigns or false identity of campaigners. Instead, such cases were considered an inherent part of engaging with crowdfunding:

“The scams, as far as I understand, are generally like legal. People have agreed to back something with a known risk and the risk comes from, in most cases, people misunderstanding what they’re agreeing to as part of the Kickstarter process” (Participant 11).

Participants were more focused on risks around the “*likelihood the project will be completed and fears over money security*” (Participant 7). When considering the legitimacy of a campaign, participants considered (i) prototype progression, (ii) assurances of success likelihood, based on campaigner’s history and track record, and (iii) the level of financial risk.

Prototype progression. Participants reported the importance of the prototype progression as a key factor in their investment decision. Those campaigns that have “*got something they were ready to deliver and they just want the money to pay for mass printing or something*” (Participant 11) are deemed more trustworthy than those that, for example, have “*still got research and development to do*” (Participant 11). In cases where the product is delivered, participants are concerned about it “*being sort of not nearly as good quality as you wanted*” (Participant 2). Therefore, it seems that rather than the legitimacy of a crowdfunder as an individual, participants may be more focused on their competency to deliver the product advertised. This is further

evidenced in the type of assurances that participants look for when conducting due diligence before making investment decisions, discussed in more detail below. For some participants, the risk factors highlighted are mitigated by the use of a well-known crowdfunding platform such as Kickstarter or IndieGoGo, as *“the third-party crowdfunding platform calms most of my security fears”* (Participant 7).

Assurances. Although a large number of crowdfunding projects come from first time campaigners, participants reported that one of the primary things they look at to provide assurance before investing is the campaigner’s history and past project success. One participant outlined their typical thought process:

“The first thing [I would look for] would be past Kickstarters. Have they produced something? Is it in the same sort of ball park as this, and has maybe showed success? If it’s showed success, looking through the timelines, so they might deliver something on time, are people happy with it? If there has been a problem with it, have communications been solid? Do they deal with issues in supply chain?” (Participant 11).

Other participants reiterated these comments, noting *“what I’d care more about is ... their ... previous successes and failures”* (Participant 5). As mentioned above though, there is often not scope to analyze previous successes as many campaigners are new to the platforms. As such, additional assurances can provide peace of mind in place of this. Within the campaign page itself, potential funders gain insight from questions raised by others:

“other people who have maybe asked questions of the person beforehand and I’ve relied on the fact that there is, not a forum, but there’s a page where their communications are listed to find out more about the product, and in some cases, assure myself that it does meet my needs or that it’s a legitimate product, so in an indirect kind of way” (Participant 11).

As well as eliciting objective information about the product, the communications between other funders and the campaigner also provide valuable social information. As such, both positive and negative comments are deemed useful:

“I like to see both [excited comments and concerns] because exciting things make me more excited and concerns are an opportunity for me to see how well a project creator problem solves it or addresses it or how they handle it” (Participant 12).

This management of communication with existing investors acts as a valuable assurance to additional potential future investors. A record of rapid and personal response to queries, such as *“responding individually within 24 hours”* (Participant 12), emphasizes a campaigner’s engagement with the project. Further to this, the way in which they respond can affect perceptions of their trustworthiness, *“if they’re dismissive, negative etc., [they are] not trustworthy in my eyes”* (Participant 7).

Assurances can also come from the number of funders already supporting a campaign, as a result of *“acting out of human nature where, because I don’t know these people and they’re strangers, I’m looking for others that have vetted it for me”* (Participant 12). The support of others is often perceived as verification that *“the project is...hugely successful, probably like the product is going to be amazing because they put a lot of effort into marketing and the video and promotion of their idea”* (Participant 1). Some participants reported more in-depth consideration of the project progress and funding to date as necessary for the development of trust, with a larger funding cohort needed to establish social proof, as demonstrated here:

“Let’s say it’s a 10,000 dollar project and they have 3,000 dollars funded so far and that 3,000 dollars is coming from 100 people, that’s not an investment but it’s a sizeable contribution from a large group of people. If that was 3,000 dollars coming from 10 people, that could just be 10 of that”

project creator's best buddies. At that point I still haven't established that trust. I'm looking for a larger group" (Participant 12).

Seeking these types of assurances can evolve outside of the crowdfunding platform, with participants noting that they look *"to see if they [the campaigner] have their own personal forum, like how they directly interact with the fans on their own platform as well as on things like Facebook and Reddit and what not"* (Participant 2). As this participant mentions, these types of online background checks often lead to social media pages run by a company or campaigner, and most participants confirmed that they use these to inform an investment decision. Simply having social media accounts linked to a campaign provides an initial level of assurance to participants, demonstrating that *"they value what social media or Facebook bring to the table and do they prioritize the importance of being engaged with it"* (Participant 12). This engagement with consumers outside of the crowdfunding platform *"can also be a bit more personal as well, so you kind of have a face to the project...there's actual people you can hold accountable for it"* (Participant 3). Participants predominantly reported using Facebook, Twitter, and Instagram as external sources of assurance when making investment decisions. Whilst a business-related Facebook page was desirable, even having a personal account linked provided some level of assurance to the identity of the campaigner:

"I mean I'd prefer them to have a [Facebook] page dedicated to whatever the project is. If they didn't have that, I'd be a little hesitant but as long as they had maybe their own Facebook profile page connected, then I'd probably be pacified there" (Participant 12).

As with other online content, social media provides valuable data demonstrating how a campaigner interacts with their consumers and investors. The frequency of activity, as well as consistency, and professionalism are taken as indicators of legitimacy through social media, *"if the writing is bad you are more concerned about levels of professionalism and potentially quality assurance"* (Participant 7). In addition, the number of followers and the way in which an organization engages with them on social media was deemed a valuable indicator of their trustworthiness, with one participant suggesting that this can be a deciding factor in investment decisions, *"if they interact with people on the social media as well, I'd be more likely to back them"* (Participant 13). Others acknowledged though that social media behavior alone cannot provide complete assurance to the legitimacy or competence of a campaigner, instead *"it's just one flag on multiple indicators but I guess just showing there is regular updates going on there, there is content which is professional"* (Participant 11).

Risk factors. Even with the assurances outlined above, most participants recognized some level of risk associated with crowdfunding, predominantly *"the risk of them delivering a product which is completely not what you expected, or it being sort of not nearly as good quality as you wanted"* (Participant 2). As such, risk awareness was more focused on competence to deliver the product, rather than legitimacy of the campaign. The extent to which participants were concerned about risk factors such as campaigner competence was mediated by the size of the investment being made. One participant notes that *"if I'm only backing something for £50, I probably won't do all of that [due diligence], but if I'm going to put like £100, £200, £300, £500, I'll look into it a lot more"* (Participant 11). The scale of investment that warrants this type of due diligence check will depend on the individual, but it is clear that this can impact decision making, and also attitudes toward project failure. As noted by another participant recalling a campaign which did not deliver at the end of the project - they *"backed it at one of the inexpensive levels, so it didn't mean that much to me when it didn't come"* (Participant 13).

4.2.6 Maintaining trust post-investment

The stages following funding a project can also be important, as this leaves an on-going impression which will dictate how a funder portrays a campaigner to others in the future. Whilst the importance of communication in the decision-making process has been emphasized above, personal experience indicated that after backing a project, participants were keen that communications be kept to a minimum. As long as there were no problems or delays, they *"don't have a need to talk to them about it"* (Participant 11), unless

the end of the campaign is nearing when “*there are some very urgent things and there is a lot of excitement behind it*” (Participant 12).

Communication from the campaigner. In the cases where a project is delayed, participants note the sense of frustration witnessed in other campaign backers, “*they’re just full of rage*” (Participant 13). Where these delays are well managed by the campaigner, most participants report that “*as long as they [the campaigners] keep you updated with what’s going on, then you don’t panic as much*” (Participant 6). Whilst delays are often expected in the process given the nature of the platforms hosting new and inexperienced businesses, a severely extended waiting time means that the likelihood of project delivery can “*become unrealistic, and especially if they lose contact*” (Participant 3).

Desired assurances. In order to address some of the concerns that participants have about monetary loss in crowdfunding, they suggested potential solutions that might alleviate this, such as a “*PayPal style grace period that...by this date if they haven’t delivered your product, then the money got bounced back to you*” (Participant 11). Similarly, “*a certain percentage of money protected, or even a protection guarantee if a company ran off with the money*” (Participant 7), was an alternative suggestion. Additionally, participants called for explicit information around “*the laws and regulations that protect you, if they were to be presented to you so you knew what protections you were getting, that would possible go some way as to reassuring you when you invest*” (Participant 6). Project vetting provided by the platform was another concept that participants felt would be reassuring, as well as campaigner references to provide additional verification. It was felt that assurances such as these would improve the decision-making process and enhance secure connectivity across crowdfunding platforms.

4.3 Discussion

Data gathered in this initial qualitative study aimed to address two research questions – firstly, to establish key factors underpinning investment decisions and establishment of trust in a campaigner; secondly, to understand current due diligence processes that users engage in. In addressing the first research question, the findings from this study highlight factors associated with initial interest in the project, and influences on investment decision-making. A lot of the factors outlined support the investment decision-making model outlined by Liang et al. [2] and discussed in more detail earlier in this paper.

Initial interest in the project was related mainly to personal interests and as such emphasizes commonalities between the potential funder and the campaigner. This is in line with the importance of value similarity, outlined by Liang et al. Value similarity is further reiterated in discussing the investment decision-making process though, with opinions of trusted friends and peers – many of whom will share our own values - deemed useful in this. In addition, project information quality, another factor outlined by Liang et al., can be seen in the current data. Participants placed emphasis on a campaign video as a good indicator of quality, suggesting that those campaigners who were not legitimate or unlikely to deliver on the product would also put less time and effort into generating the content for the campaign page. This is in line with previous research which has demonstrated that the mere presence of a campaign video can predict the number of investors a campaign will receive [14].

A drawback to the reliance on the campaign video to demonstrate a trustworthy campaign, as highlighted by some participants, was that this is an element where even if quality is high, this does not guarantee an ability to produce and effectively deliver the product being advertised. Although a well-made campaign video may go some way to alleviating risk factors, it does not necessarily demonstrate the competence of the campaigner. As such, the findings reported here seem to demonstrate an overwhelming reliance on social information to assess campaigner competence, through assessment of reputation and social credibility. Where strong evidence of fundraiser ability is available, through campaign history and previous business activity, this is valued by funders [16, 17, 18]. However, as many campaigners are bringing their first product to market, this

information is often lacking and as such crowdfunding produces a unique paradigm where social information becomes a more valuable asset in investment decision-making.

In the Literature Review, we suggest that the ‘fundraiser reputation’ concept outlined in Liang et al.’s model could be re-considered to incorporate wider social information as well as just reputation. This is supported within the data reported here to highlight the importance of broader ‘social credibility’. Although there is some emphasis on the reputation of the campaigner in the decision-making process, through acknowledgement of reviews and comments from others, participants also reported reliance on connectedness and communication ability (as in [23]). By accessing information through social media, participants reported that they were able to gain an impression of how well a campaigner communicated with customers, particularly surrounding negative comments, and as such were able to make judgments about their engagement and commitment to the crowdfunding process.

The data from this study also considers how funders maintain trust following an investment, especially when there is a delay in the delivery of the product. In this scenario, communication from the campaigner was highlighted as a key assurance, in line with Kim et al.’s [5] model of trust maintenance during a delay. This model highlights a number of other factors – domain expertise, delay duration, background research, and funder identity – that influence the way in which a funder responds to a delayed project. Although the emphasis is on maintaining trust following investment rather than initial investment decision-making, the model draws upon similar information in understanding the trust relationship. With reference to prior experience and pre-investment due diligence checks, Kim et al.’s model suggests that funders are able to maintain trust if there is evidence to suggest a campaigner is trustworthy and reliable, in the same way this information can inform the initial decision to invest.

Many of the factors outlined within the data are also representative of Cialdini’s [24] six principles of persuasion (reciprocation, liking, social proof, commitment, authority, and scarcity). In particular, a reliance on the opinions and perceptions of other crowdfunders and social media followers highlights the importance of *social proof*. Whilst the effectiveness of good communication skills in supporting campaigners’ social credibility can be seen as *commitment* to their campaign. The role of *scarcity* in terms of availability of the product was also highlighted by some participants, with the potential to encourage oversight of normal due diligence checks in order to ensure access to a limited-edition version. The presence of these persuasion techniques within campaigns not only reiterates the key factors surrounding decision-making, but also draws attention to a number of aspects that could be manipulated within a fraudulent campaign to elicit trust, and ultimately investment.

Most of the participants in this study acknowledged that there are risks associated with engaging in crowdfunding, particularly around a lack of legal regulation and security if a campaigner does not deliver a product. In answering our second research question, the data presented highlight a number of steps that participants reported taking in order to conduct due diligence checks before making an investment decision. Some of these tie in more broadly with the factors influencing decision-making and can be incorporated within a broader model of decision-making, such as assessment of project quality, prototype progression, prior crowdfunding experience, and social credibility of the fundraiser. However, one element that is somewhat overlooked in Liang et al.’s model is the role of social media in this process. Whilst the content of a campaign page could be easily manipulated, participants perceived social media to be a more reliable source of information regarding the legitimacy of a campaigner. External platforms such as Facebook, Twitter, and Reddit provide additional information to verify the identity of a campaigner but also provide further social information from a wider audience of followers. These allow potential funders to essentially run ‘background checks’ on a campaigner in order to provide assurance of the legitimacy of a campaign before investing. One issue with this, which will be discussed in more detail later in the paper, is that the information presented on social media is also at risk of being manipulated [22] to elicit the desired response from a potential funder.

Across all aspects of the crowdfunding process, it becomes apparent that social factors play a key role in investment decision-making, and funders are reliant on the opinions and behaviors of others to inform their own decisions. This data builds upon prior literature which looks at factors influencing campaign success, by engaging crowdfunders and exploring the processes that they consciously engage in when making investment decisions. As outlined earlier, the participant sample recruited for this study reached data saturation and included crowdfunders from a range of backgrounds with varying levels of experience. However, we acknowledge that the sample size may still be considered small and the generalizability to a wider population of potential funders cannot be guaranteed. In order to validate the findings reported in this study, a second quantitative study was conducted, providing a valuable mixed methods approach to addressing the research questions posed [26]. This quantitative study places more emphasis on the due diligence process and use of external social information from social media, in line with our focus on the processes that users engage to address risk factors and navigate trust relationships in crowdfunding. In addition to this, the quantitative approach allows for additional individual difference factors to be considered in relation to the investment decision-making process, in order to assess whether specific psychological characteristics are associated with investment behaviour.

5 Study 2: Survey study to quantify factors influencing crowdfunding investment decision-making

Following on from Study 1, this study aims to triangulate the key findings around investment decision-making - and in particular due diligence - with a broader participant sample, whilst introducing additional measures of individual differences between participants. The study aims to address the same research questions as outlined in the Introduction, examining the investment decision-making process, and the due diligence checks that participants engage in, both on the crowdfunding platform and via social media. Findings from Study 1 emphasized the importance of social information in the investment decision-making process, which will again be explored in this study. In order to explore the alleviation of risk and negotiation of trust in crowdfunding, this section of the paper will place more emphasis on the due diligence checks that users engage in when making investment decisions. Due diligence, particularly outside of the crowdfunding platform, provides assurance to users with regard to campaign legitimacy and campaigner competence, as outlined in Study 1. This study will quantify the due diligence process, whilst also exploring the relationship between perception of risk and likelihood to engage in due diligence checks. Expanding upon the topics previously covered, this study will also take into account the potential role of individual difference factors including impulsivity, risk-taking behavior, and propensity to trust. In understanding the characteristics that might lead to increased investment likelihood and potential oversights in due diligence, this research may inform the development of security solutions that aim to protect the most at-risk users of crowdfunding platforms.

As outlined earlier on in this paper, there is an inherent risk factor associated with crowdfunding investment. This is because campaigners often do not have a financial or business history to base investment decisions on and also due to the lack of legal regulations in place to protect a funder from fraudulent campaigns or from those that do not deliver the promised goods. This research will therefore assess individual differences in risk-taking behavior, to establish whether this acts as a pre-cursor to investment. In particular, focusing on financial and social risk-taking to establish how these factors map on to crowdfunding behavior. Previous research into individual differences in risk-taking behavior has demonstrated links to gambling behavior [30] and increased likelihood to bid in a simulated online auction [31]. It is therefore hypothesized *that individuals who are higher risk-takers will typically make larger crowdfunding investments.*

Individual differences in impulsivity have also previously been associated with financial risk-taking [32] and gambling behavior [33]. As such, it is hypothesized that *participants who display higher levels of impulsivity*

will make larger investments, but may also be less inclined to engage in due diligence checks before making investment decisions. An additional factor that may impact upon the likelihood to engage in due diligence is propensity to trust – whereby a person has a general tendency to trust others, particularly in unfamiliar situations where the other person is a stranger [34]. As highlighted earlier in this paper, trust is a crucial element of business transactions, but is of particular relevance in crowdfunding where there are increased levels of uncertainty around the campaigner and the success likelihood of the proposed product. Propensity has been shown to be a strong predictor of trust [35], and as such may lead a potential crowdfunder to be more trusting of an unfamiliar campaigner, without feeling the need to engage in time-consuming due diligence checks. It is hypothesized that *participants with a higher propensity to trust will be less likely to engage in due diligence checks.*

Whilst there is clear motivation to explore each of these individual difference factors in relation to crowdfunding - based on prior links with other financial risk-taking scenarios - this link has not previously been made within the academic literature. As such, this study will provide novel insight into the factors that impact typical crowdfunding behavior and investment habits.

In summary, this second study will use quantitative methods to validate findings from study 1 around investment decision-making and due diligence. It will also explore individual differences between users that may influence the processes associated with crowdfunding, and the establishment of trust in an unknown campaigner.

5.1 Materials and methods

Ethical approval for this research was granted by the University of Dundee School of Nursing and Health Sciences Research Ethics Committee. All participants gave fully informed written consent before taking part.

5.1.1 Participants.

Two hundred and three active crowdfunders were recruited through an online participant site (prolific.ac). Although recruitment requirements specified that participants should have previously funded someone they did not know personally and engaged in either rewards- or equity-based crowdfunding, some participants did not meet these criteria. Therefore, these participants ($N = 64$) were removed from the analysis. This left a sample of 139 participants, consisting of 84 males, 52 females, and 3 who identified as transgender or 'other'. The mean age for the sample was 33.02 years ($SD = 9.53$), with a range from 18 to 69 years.

5.1.2 Materials.

A questionnaire was developed for the purpose of this study to triangulate findings from study 1 with additional quantitative data. The core part of the questionnaire, reflecting upon participant experiences with crowdfunding, was developed based on the themes drawn out of qualitative data in study 1. As a result, this consisted of four sections:

- 1) Demographics
- 2) Crowdfunding experience
- 3) Investment decision-making
- 4) Due diligence

Questions around *crowdfunding experience* were designed to gather descriptive data about the participant sample, outlining type of crowdfunding, typical investment size, negative experiences, and confidence in making secure investments. To explore *investment decision-making*, questions asked participants about how they discover campaigns, and what their motivations are, before going on to explore the role of elements of the campaign page highlighted in study 1 (e.g. professionalism, prototype progression) and social influence factors (e.g. familiarity, liking, reciprocity).

The section on *due diligence* focused initially on due diligence around the campaign page itself, and then asked about checks that participants run on social media before deciding to invest in a campaign. For each of these sections, a sum score was taken based on a 5-point response scale to produce a due diligence ($N = 3$; score range: 3-15) and a social media due diligence score ($N = 8$; score range: 8-40) for each participant. Reliability analysis for the due diligence questions demonstrated that the item ‘the number of backers already supporting the campaign’ reduced the Cronbach’s alpha score, so this item was removed to produce an alpha score of .61 for the remaining 3 items. For social media due diligence, the 8 items produced a Cronbach’s alpha score of .80. The final part of this section asked participants about the extent to which they associate a series of risks with crowdfunding, such as ‘fake backers’; ‘financial loss’; and ‘loss of personal data’. In order to generate a score for participants’ risk awareness, a sum of responses to these 6 items was generated (maximum score: 30), producing a Cronbach’s alpha score of .76. A list of the original scale questions given to participants can be seen in Appendix 1. Correlation matrices for all sets of questions that have been compiled into sum scores are shown in Appendix 2.

The final part of the questionnaire used well-established measures to assess individual differences in propensity to trust, impulsivity, and risk-taking behavior. In order to measure propensity to trust, the Propensity section from Mayer and Davis’ [36] ‘Measures of Trust, Trustworthiness, and Performance Appraisal Perceptions’ was used. Following reverse scoring as appropriate, responses to this scale generated a Cronbach’s alpha score of .73 with all 8 items included. Questions were measured on a 5-point scale, and a mean score across these was taken to give a propensity to trust score (score range: 1-5). Impulsivity was measured using the 30-item Barratt Impulsiveness Scale (BIS-11; [37]), with responses given on a 4-point scale, and a sum score taken for each participant (score range: 30-120). The reliability for this scale generated a Cronbach’s alpha score of .81. Finally, risk-taking was measured using the 12 items from the financial and social subscales of the Domain Specific Risk-Taking Scale (DOSPERT; [38]), with responses given on a 7-point scale. A sum score across these two subscales was calculated (score range: 12-84), as well as a score for each subscale individually (score range: 6-42). Reliability measures for these scores, assessed using Cronbach’s alpha, were .78, .65, and .83 respectively. All of the scale response questions were presented to participants in matrices. In order to address issues of straight lining within the data simple nondifferentiation analysis was conducted to detect participants who had given the same response for all questions within a scale. For each scale, data from participants who showed evidence of straight lining was removed. Table 2 indicates the proportion of participants who were straight lining for each scale, and the sample size for that scale once these had been removed.

Table 2. Outline of data screening relating to straight lining

Question topic	% straight liners	N following removal of straight liners
Investment decision-making	7.2	129
Social influence	2.2	136
Due diligence	10.1	125
Social media	7.9	127
Risk factors	7.9	128
Propensity to trust	0.7	137
Impulsivity	0.0	139

Risk-taking	0.0	139
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5.1.3 Procedure.

Following sign-up on the online recruitment site (prolific.ac), participants were directed to the questionnaire, hosted on JISC Online Surveys. Participants were given full information about the purpose of the research and right to withdraw, and following consent, continued to complete the questionnaire. Following completion, participants were debriefed and thanked for their time.

5.2 Results

5.2.1 Crowdfunding experience.

Within our sample, 15.8% reported that they had engaged in equity-based crowdfunding, 70.5% in rewards-based crowdfunding, and the remaining 13.7% in both. When asked about the average size of investment that they made in a crowdfunding campaign, the majority of participants ($N = 54$) invested £21-50, followed in frequency by smaller investments of £1-20 ($N = 42$), then £51-100 ($N = 29$), and over £100 ($N = 14$). The mean number of campaigns that participants had funded was 12.08, with the majority of participants (50.4%) classing themselves as beginner crowdfunders.

Of the crowdfunders recruited, 29.5% ($N = 41$) reported that they had previously had a negative experience whilst supporting a crowdfunding campaign. The most common cause reported was a delay in receiving the advertised product ($N = 30$), followed by non-delivery of the product ($N = 21$), poor communication from the campaigner ($N = 18$), loss of money ($N = 12$), and the final product not being as advertised ($N = 3$).

5.2.2 Investment decision-making process.

Participants were initially asked where they typically discover campaigns that they go on to invest in. Responses are shown in Figure 1, which highlights social media as the most common source.

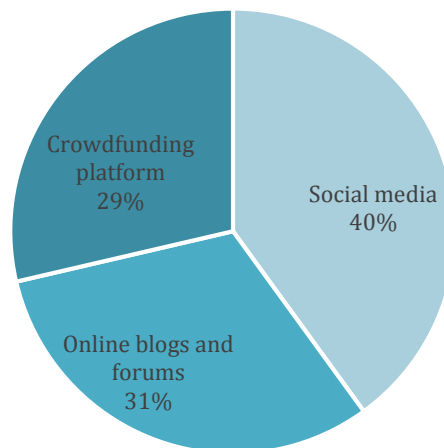


Figure 1. Chart to demonstrate where participants typically source crowdfunding campaigns to support

Mean values for all questions relating to investment decision-making can be seen in Appendix 1. As shown in Figure 2, when asked about the importance of various elements within the crowdfunding campaign in the investment decision, participants rated both professionalism and prototype progression as more important than a personal approach and the campaign video ($ps < .001$). A personal approach was also deemed more important than the campaign video ($p < .001$). No difference was found in the importance placed on professionalism and prototype progression ($p = .58$). In relation to the social influence questions, participants demonstrated that they would be more likely to invest in a campaign when they had previous experience with the company, demonstrating the importance of familiarity. This was rated significantly higher than all other social influence factors explored, $ps < .01$.

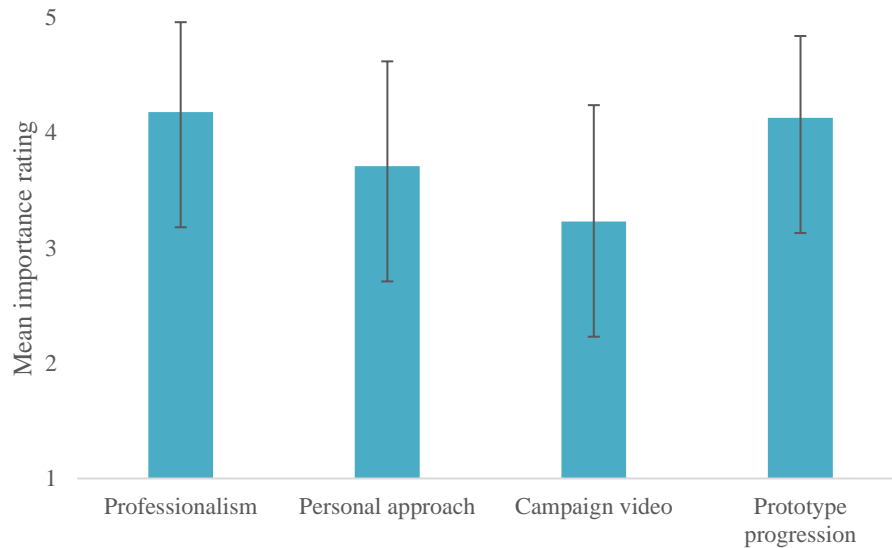


Figure 2. Mean response to questions about importance of campaign elements to investment decision (standard deviation shown as error bars)

5.2.3 Due diligence.

Based on questions relating to due diligence within the campaign page itself, a mean sum score of 12.66 (SD = 1.96; max. score 15) was calculated. Again, individual item means can be seen in Appendix 1. Based on these, 'How much communication the campaigner has had with other backers' was perceived less influential in investment decision-making than 'Comments from other backers and supporters of the project' and 'The campaigner's prior history of crowdfunding projects' ($ps < .05$). However, all three items were rated as at least 'a little' influential in the investment decision (all $M_s > 4$). Due diligence was compared across typical investment size categories, and no significant difference was found, $F(3, 135) = 0.24, p = .87$. This suggests that participants are no more or less likely to engage in due diligence checks, regardless of the amount of money they are typically risking in an investment.

Within our sample, 74.8% of participants reported that they have previously used social media to look into the background of a campaigner or company to inform their investment decision. Figure 3 shows the social media platforms most commonly used for such background checks.

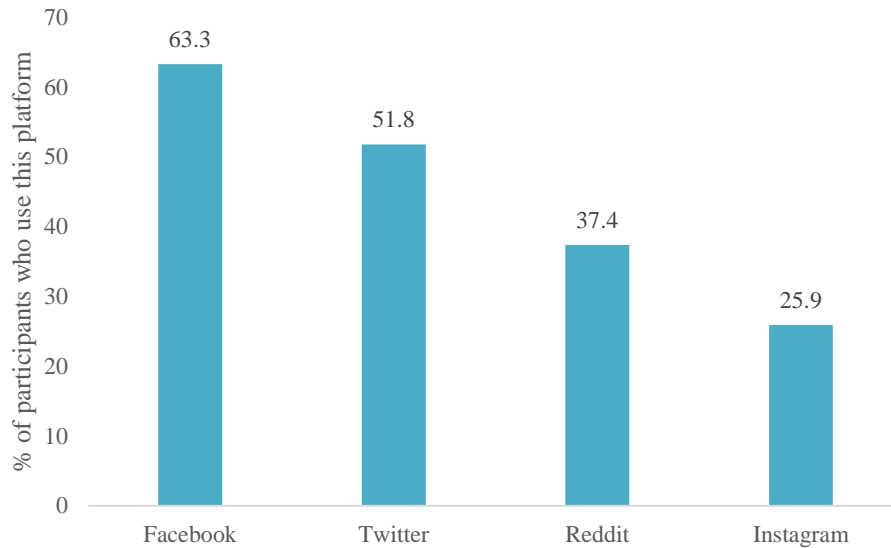


Figure 3. Percentage of participants who report using each social media platform to perform background checks on a campaigner

A sum score for questions around social media due diligence generated a mean value of 33.14 ($SD = 4.46$; max. score 40). Again, the mean values for all items here are above 3.5, indicating acknowledgement from participants that all of these issues are at least ‘a little’ influential on decision-making. Social media due diligence scores were also compared across typical investment size groups, with no difference found, $F(3, 123) = 0.50$, $p = .69$. Those participants who reported that they use social media as a source for finding campaigns to fund placed higher importance on the social media due diligence measures ($M = 34.24$, $SD = 3.35$), based on their total score for these questions, than those who did not ($M = 31.34$, $SD = 5.42$), $t(69.06 - \text{adjusted for non-equal variances}) = -3.35$, $p < .01$. This association between finding campaigns and due diligence may suggest that some users have a stronger link between crowdfunding and social media, and as such there may be a certain type of user who is more likely to rely upon social media signals for conducting due diligence.

When asked whether they consider crowdfunding to be a risky activity, 61.9% reported that they did. Looking at specific risk factors (as shown in Figure 4), ‘failure to deliver the product’ ($M = 4.12$, $SD = 0.96$) was considered significantly more of a risk than all other factors apart from ‘financial loss’, $ps < .01$. On the other hand, ‘loss of personal data’ ($M = 2.79$, $SD = 1.07$) was the lowest rated risk factor compared to all of the others, $ps < .05$. A sum score for risk perception across these factors was calculated, generating a mean score of 21.04 ($SD = 4.30$; max. score 30). Simple linear regression demonstrated that recognition of risk factors predicted due diligence score ($R^2 = .07$, Adjusted $R^2 = .06$) with increased recognition of risk factors linked to increased likelihood to engage with due diligence measures ($\beta = .26$, $t = 2.86$, $p < .01$), $F(1, 116) = 8.16$, $p < .01$. No such relationship was found between risk perception and due diligence conducted on social media ($p = .37$).

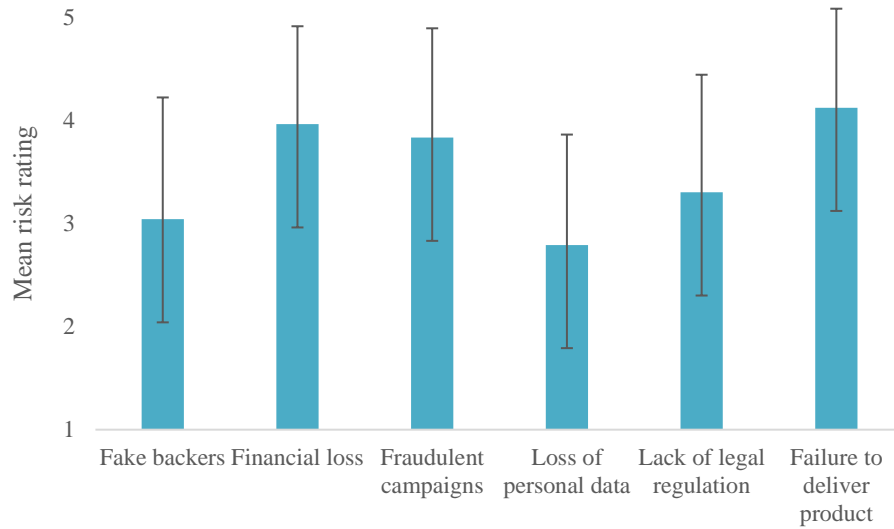


Figure 4. Mean response to questions about risk factors associated with crowdfunding (SD shown as error bars)

5.2.4 Individual differences.

Descriptive statistics for measures of risk taking, impulsivity, and propensity to trust are outlined in Table 3. Multinomial regression analysis demonstrated that scores on the DOSPERT scale were predictive of investment size, with those who invest £100+ on average having significantly higher risk-taking scores than the £1-20 ($p < .01$) and £21-50 ($p < .05$) categories, $X^2(3, N = 139) = 8.26$, Nagelkerke $R^2 = .06$, $p < .05$. When the DOSPERT Financial and Social subscales were entered separately into a multinomial regression, a significant model was produced, $X^2(6, N = 139) = 13.09$, Nagelkerke $R^2 = .10$, $p < .05$. Financial risk-taking was significantly greater in those who typically invest £100+ compared to those who invest £1-20. Results for both analyses are summarized in Table 4. No differences in investment size were found based upon impulsivity and propensity to trust scores, $ps > .05$.

Table 3: Descriptive statistics for individual difference measures

Measure	Mean	SD
DOSPRT	46.67	10.37
Financial	16.76	7.41
Social	29.91	5.43
BIS11	62.43	9.79
Propensity to trust	22.23	4.39

Table 4: Summary of regression analyses

Regression analysis	Predictor	£100+ investment vs.	B	OR	<i>p</i>
1	DOSPERT	£1-20	-0.08	0.92	< .01
		£21-50	-0.08	0.93	< .05
		£51-100	-0.06	0.94	< .05
2	DOSPERT	£1-20	-0.10	0.91	< .05
		£21-50	-0.07	0.94	.10
		£51-100	-0.02	0.98	.69
	Social	£1-20	-0.07	0.94	.33
		£21-50	-0.10	0.91	.15
		£51-100	-0.15	0.86	< .05

A series of regression analyses were conducted to explore the relationship between individual difference factors and likelihood to engage in due diligence checks, on the campaign page or through social media, when deciding whether to fund a campaign. No significant relationships were found, with all p 's > .05. Further regression analysis demonstrated that propensity to trust was a significant predictor of awareness of crowdfunding related risk factors ($R^2 = .07$, Adjusted $R^2 = .06$). Increased propensity to trust predicted lower awareness of risk factors ($\beta = -.26$, $t = -2.95$, $p < .01$), $F(1, 124) = 8.69$, $p < .01$.

5.3 Discussion

In this study, a quantitative survey sought to triangulate findings from initial qualitative interviews with active crowdfunders. Questions explored various aspects of the crowdfunding process, with particular emphasis on due diligence checks, social media engagement, and individual differences between users. As in Study 1, prototype progression is highlighted as a key objective measure of competency to deliver the product, linked in to the notion of project information quality, as highlighted by Liang et al. [2]. The role of social information is again emphasised in the decision-making process though, alongside objective reassurances. Initial perceptions of the campaigner and their competency to complete the project, with particular regard to professionalism are deemed important. This emphasizes the human-centered nature of a peer economy such as that seen on crowdfunding platforms. Individual crowdfunding investors are making decisions not only about a product or organization that they want to support financially, but also about the person who is behind the campaign.

As well as being a valuable source for finding out about campaigns in the first place, social media is again recognized by participants as a resource for conducting due diligence checks on a campaigner. Almost three quarters of our participants (74.8%) reported that they use social media when conducting such checks. Availability of social information is again recognized as valuable in allowing users to navigate the uncertainties of the crowdfunding process, and support development of trust in a campaigner. Delving further into this due diligence process, it seems that information garnered from other crowdfunders is recognized as being one of the most important due diligence factors. This is consistent with findings from our interview data, with emphasis being placed on prior feedback available from other users. Social media provides

additional assurances to the funder, through publicly available information demonstrating how others have rated the campaigner, as well as giving an insight into how the campaigner interacts with their customers or investors. This reliance on social proof and evidence that a campaigner is committed to the project through updates and interaction with customers, also reiterates the role of social psychological constructs around persuasion, and the impact such information can have on decision-making [24].

Although this persuasive content is consistent for all potential funders, not all will make the decision to invest. As such, it is of interest to consider the individual differences between users that may also influence the decision-making process. This study explored the role of risk-taking tendencies, propensity to trust, and impulsivity. Impulsivity was not found to be a significant indicator of investment likelihood, possibly due to the more analytical approach that our participants reported taking, in conducting due diligence and background checks rather than making an on the spot investment decision. A majority of our participants (61.9%) did recognize that crowdfunding is a risky activity, and when looking in more depth at specific risk factors, it becomes clear that awareness of these factors increases the likelihood that a crowdfunder will engage in due diligence. Interestingly, when we measured participants' propensity to trust, we demonstrated that a higher propensity was associated with lower awareness of risk factors. This indicates that those who are predisposed to trust others do not necessarily consider the risks that may be associated with an investment activity such as crowdfunding. However, there is no direct evidence from our data to suggest that this propensity to trust has a role in the likelihood to engage in due diligence, or in fact a link to vulnerability.

Our data do suggest that a predisposition to engage in more risky activity, as measured by the DOSPERT scale, was predictive of investment size. Of particular interest, is the finding that those participants who scored higher on the financial elements of the DOSPERT scale were significantly more likely to invest £100 or more on an individual crowdfunding campaign. This demonstrates that a willingness to take financial risks may lead to larger investments. Surprisingly, no direct link was found between a disposition for risk-taking behavior and the likelihood to engage in due diligence. This suggests that even though those users who demonstrate a higher disposition to risk taking are willing to invest more, they are still engaging in due diligence checks in an attempt to protect themselves before doing so.

Overall, findings from this study further support those reported in our first study and reiterate the crucial role that social information plays in crowdfunding investment decision-making and navigating the risks associated with this. Information about the campaigner on a personal level, and information garnered from the opinions of other customers and investors, are consistently found to be influential factors. Further to this, data from this study demonstrate the role that individual differences in risk-taking behavior can play on the size of investments made. Understanding more about the individuals who engage in risky crowdfunding behaviors, as well as understanding the factors underpinning investment provide a grounding for increased user protection when engaging with this process.

6 General discussion

The research reported in this paper aimed to address two core research questions:

RQ1: Based on firsthand insights from crowdfunders, what factors underpin the investment decision-making process, and development of trust in a campaigner?

RQ2: What due diligence processes do crowdfunders currently engage in, both on the campaign page and through external social media pages?

By employing a mixed methods approach that sought firsthand insights from experienced crowdfunders, we were able to draw out the key influential factors that were present across both of these studies. In Study 1,

qualitative interview data provided insight into the investment decision-making process, highlighting the importance of the campaigner's professionalism, and the content of the campaign page (including video and a project plan) to the establishment of trust in a campaigner. In addition, the role of various social influence principles were apparent when participants discussed their typical decision-making process – in particular, *familiarity*, *social proof*, and *liking* [24]. Further to this, and in response to RQ2, participants outlined their typical due diligence process when considering a project to fund, and highlighted campaigner history, prototype progression, and social media activity as key assurances that they would look for.

In Study 2, data from a quantitative survey reiterated many of these key findings, again emphasizing the role of prototype progression and liking the campaigner in the initial decision-making stages. Less importance was placed on the campaign video in this data compared to other factors, unlike in Study 1 and other previous research [e.g. 14]. However, it should be noted that the mean values for all factors outlined here were well above the mid-point, indicating some importance was placed on them. Study 2 placed a stronger emphasis on understanding the due diligence process, as well as considering individual differences between users. In contrast to Study 1, there was no quantitative evidence to support the notion that larger investments would lead to increased due diligence checks being performed. However, the role information from other funders and via social media was again reiterated, with a majority of participants recognizing that crowdfunding is a risky activity, and as such due diligence is an important part of the process. Increased recognition of such risk was predictive of due diligence being carried out, suggesting that this acknowledgement may be a key part of protecting users against security threats such as fraudulent campaigns. However, it should be noted that the amount of variance in due diligence checking was only partially explained by recognition of risk factors (~ 7%) and as such this cannot be considered a sole contributing factor. Additional data would be needed to consider further factors that input into the decision to engage in due diligence checks. Finally, Study 2 also considered the role of individual difference factors between users that might predict investment behavior. Findings demonstrated that those who are more inclined to take risks are also likely to make larger crowdfunding investments, in line with previous research demonstrating links to gambling [30] and online auctions [31].

Earlier in the paper, a theoretical model from Liang et al. [2] was outlined, which explains establishment of trust in crowdfunding scenarios. The authors highlight four key elements to building trust and as such increased investment likelihood: project information quality, fundraiser ability, fundraiser reputation, and value similarity. This model is further supported somewhat by the findings presented in this paper, with evidence that participants are reliant on information about prototype progression [project information], and ability of the campaigner [through past campaigns and commitment to the project]. The data collected in this research builds upon the concept of fundraiser reputation though, to incorporate a wider array of social information that can be used to make judgements about the legitimacy of the campaigner. In fact, the key message that was persistent across both studies reported was the vital role that other people play in the decision-making process – emphasizing the social nature of engagement with crowdfunding. Unlike traditional investment methods, crowdfunding users are reliant on social information both about the campaigner, and about the opinions of other users. In line with social psychological literature on influence and persuasion, a number of Cialdini's [24] principles of persuasion were present in the crowdfunding process. In Study 1, the role of *scarcity* was discussed, with a limited-edition version of a product being deemed more appealing. Whilst across both studies, *social proof* through feedback from others, and *liking* of the campaigner were found to play a crucial part in increasing the likelihood to invest in a campaign.

A second core finding from both studies that is not discussed in Liang et al.'s model was around the importance of social media in the due diligence process. Almost three quarters of participants in Study 2 reported that they use social media to find background information on a campaigner, and this was also highlighted in Study 1. Again, *social proof* was a key element of this process, with social media being one method by which users could access information about how other users perceived the campaigner. Prior positive reviews and feedback were taken as a reinforcement of the campaigner's competency. Social media

also provided reassurance though that the campaigner was genuine, with an emphasis placed on recent updates and activity on the page. This touches upon another of Cialdini's principles – *commitment* - which suggests that consistency in behavior and actions is often perceived as trustworthy, and as such evidence of this in a campaigner could increase likelihood to invest. One key issue around the reliance on social media information for establishing trust and making judgements about campaign legitimacy though, is the unreliability of signals produced. Social media information can easily be manipulated to emulate the social influence mechanisms shown to be persuasive to users in this research, for example multiple fake accounts can be used to suggest strong communication ability, and fake reviews can be added to a page to suggest social proof. Although researchers have previously demonstrated that fraudulent campaigners are less likely to have a social media presence [18], it is plausible that in a minority of more sophisticated cases, a positive social media presence could be faked in order to increase believability of a fraudulent campaign. Social media presence alone has been shown to increase likelihood that a campaign will reach its target [20, 21], and as such users should be aware of the unreliability of signals available through social media, with support needed to help them effectively navigate this information and ensure that trust is being placed in the right campaigners.

Based on our findings, which demonstrate the importance of social information and social media on the decision-making process, it is important to recognize this in future attempts to protect users from fraudulent crowdfunding campaigns. It has been noted by previous researchers that reputation systems, such as those used on other peer-based platforms including AirBnB and Uber, are not plausible in crowdfunding due to new campaigners not having this data available [5]. As well as the need to identify fraudulent campaigns, the need to verify this social information is also vital to support legitimate campaigners who do not have feedback available from previous customers. These campaigners may be disadvantaged in the crowdfunding sphere, as investors do not have the desired social information available to them to inform the decision-making process. This may in part explain the low success rate for crowdfunding campaigns in general, with less than 50% receiving their funding target. As outlined earlier, this research forms part of a wider project, which is developing block-chain based security services that aim to verify social information from a variety of sources as a way of addressing the unreliability of these signals. This will support non-experts to navigate the vast information available to them when conducting due diligence checks around crowdfunding campaigns. By incorporating information from personal accounts as well as any prior business activity, this approach does not disadvantage first time campaigners. The solution is effectively generating a 'social credit score' for a campaigner, giving a potential investor an indication of their legitimacy, from the social perspective that they are so often reliant on in their decision-making anyway.

6.1 Limitations and future research

Whilst the qualitative nature of the data gathered in Study 1 provides a rich data set with key insights into investment decision-making, we acknowledge that the sample size for this study is small ($N = 11$). However, care was taken to ensure that data saturation was reached within this sample, and wide recruitment meant that participants from a range of backgrounds and geographical locations could be sampled. Regardless, care should be taken in assuming generalizability of this data. Further validation of the data was established though through the triangulation of these findings with a larger quantitative dataset (Study 2). providing added assurance. Consistent findings across both studies reported provides a solid grounding for conclusions around the importance of social information in crowdfunding.

It is important to also acknowledge though that the data collected in Study 2 may be subject to typical biases associated with self-report data – in the sense that participants are being asked to reflect upon their own crowdfunding behavior and may not be able to put themselves in that situation whilst completing a survey. It is worth also noting that there is a gender imbalance in both studies, which may affect the findings, again reiterating the need for caution in assuming generalizability of the data.

Future research may benefit from the addition of behavioral measurements of decision-making to strengthen the findings reported here, and move away from reliance on self-report methods. Although, this research has elicited primary data from crowdfunding users where a lot of previous research has relied on secondary analysis of campaign pages. Asking participants to rate actual crowdfunding campaigns, with levels of available social information manipulated, would however provide a more accurate and empirically robust representation of how this influences participant decisions. The data reported here provide a good grounding for ongoing research in this area and provide direction for researchers wishing to explore this topic in more depth. A further consideration in terms of improving the applicability of this research knowledge is to consider differences in crowdfunder motivation. Ryu and Kim [39] outline a taxonomy of funder types, each with different motivations and objectives for engagement in the crowdfunding process. It would be interesting to consider whether the factors that are prioritized when making investment decisions differ between these different types of funders. In developing this more in-depth understanding of individual users, the security solutions such as those outlined in this paper may be tailored more appropriately to support and provide assurances to users.

7 Conclusions

Across two studies, we report findings that emphasize the key processes that crowdfunders undertake when deciding whether or not to invest in a campaign, incorporating initial decision-making and due diligence checks that potential funders undertake. We build upon previous research that has outlined elements of the decision-making process, providing firsthand accounts from experienced crowdfunders. By developing an understanding of the psychological mechanisms underpinning investment decisions, as we have started to in the research reported here, we can gather a more in-depth understanding of how users behave. This is a crucial element to the on-going development of technological solutions that are designed to support users in navigating the due diligence process and ensuring that they can make informed decisions about who to place trust in when considering investment. Systems that are able to verify the social information that users report relying upon to make decisions can alleviate the uncertainty associated with the crowdfunding process and provide added assurance when placing trust in an unknown party. Not only do our findings provide evidence of the social processes behind investment within the peer economy, they also start to draw upon individual differences between users that might increase risky investment decisions. Ultimately, this allows us to build a picture of how crowdfunding users might be manipulated, as well as recognizing those users who may be more at risk to fraudulent campaigns, or in the case of investment size, have the most to lose.

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A APPENDICES

A1. Scale response survey questions with mean rating across participants

Topic	Questions	Mean /5 (SD)
Investment decision-making	<i>Please indicate how important you feel each of the following elements of a crowdfunding campaign are to your investment decision.</i>	
	1. Professionalism of the campaign	4.18 (0.78)
	2. A personal approach from the campaigner (e.g. story about project background)	3.71 (0.91)
	3. Campaign video	3.23 (1.01)
	4. Progression of product prototype	4.13 (.71)
Social influence	<i>I would be more likely to invest in a crowdfunding campaign if...</i>	
	1. I had previous experience with the company running the campaign (<i>familiarity</i>)	3.91 (0.92)
	2. A campaign had raised 85% of the total funding goal, with 8 backers (<i>low social proof</i>)	3.04 (1.04)
	3. I could purchase a limited edition version of the product, even if this is at a higher price (<i>scarcity</i>)	3.09 (1.13)
	4. A campaign had raised 20% of the total funding goal, with 96 backers (<i>high social proof</i>)	3.08 (0.74)
	5. I feel that I have a lot in common with the campaigner (<i>liking</i>)	3.67 (0.90)
	6. I feel that I like the campaigner (<i>liking</i>)	3.90 (0.79)
	7. A campaign had raised 85% of the total funding goal, with 96 backers (<i>high social proof</i>)	3.63 (0.92)
	8. The campaigner had previously funded a crowdfunding page of mine (<i>reciprocation</i>)	3.01 (1.07)
	9. A campaign had raised 20% of the total funding goal, with 8 backers (<i>low social proof</i>)	2.85 (0.86)
Due diligence	<i>To what extent do you consider the following factors when making investment decisions?</i>	
	1. How much communication the campaigner had had with other backers	4.06 (0.96)

	2. Comments from other backers and supporters of the project	4.33 (0.76)
	3. The campaigner's prior history of crowdfunding projects	4.27 (0.88)
	4. The number of backers already supporting the campaign (Item removed from analysis due to low reliability)	4.00 (0.96)
Social media	<i>To what extent do you think each of the following factors, relating to a company/campaigner's social media page, influences your investment decision?</i>	
	1. Having a social media presence	3.97 (1.05)
	2. Number of followers/likes	3.50 (1.03)
	3. Frequency of posting	3.80 (0.98)
	4. Quality of post content	4.45 (0.79)
	5. Relevance of content posted to campaign	4.38 (0.73)
	6. Level of interaction with followers	4.16 (0.80)
	7. How recently the page has been updated (with news, posts, information, etc.)	4.41 (0.77)
	8. Positive feedback from previous customers	4.47 (0.67)
Risk factors	<i>To what extent do you associate the following security risks with crowdfunding investment?</i>	
	1. Fake backers	3.04 (1.18)
	2. Financial loss	3.96 (0.95)
	3. Fraudulent campaigns	3.83 (1.06)
	4. Loss of personal data	2.79 (1.07)
	5. Lack of legal regulation	3.30 (1.14)
	6. Failure to deliver product	4.12 (0.96)

A2. Correlation matrices

Correlation matrix for questions relating to due diligence

Question	1	2	3
1	1.00		
2	.43*	1.00	
3	.28*	.34*	1.00

Note. * $p < .01$

Correlation matrix for questions relating to due diligence – social media

Question	1	2	3	4	5	6	7	8
1	1.00							
2	.55**	1.00						
3	.49**	.67**	1.00					
4	.43**	.40**	.59**	1.00				
5	.14	.16	.36**	.48**	1.00			
6	.15	.27**	.33**	.34**	.35**	1.00		
7	.21*	.20*	.35**	.45**	.46**	.42**	1.00	
8	.06	.18*	.18*	.26**	.28**	.33**	.29**	1.00

Note. ** $p < .01$, * $p < .05$

Correlation matrix for questions relating to risk factors

Item	1	2	3	4	5	6
1	1.00					
2	.46**	1.00				
3	.44**	.45**	1.00			
4	.31**	.20*	.30**	1.00		
5	.18*	.18*	.29**	.60**	1.00	
6	.29**	.45**	.49**	.29**	.33**	1.00

Note. ** $p < .01$, * $p < .05$